WHAT IS CLAIMED IS:

1. A nondestructive apparatus using a guided wave, comprising:

waveform forming means for forming a transmission waveform by employing a reference waveform;

a transmitting element for generating a guided wave within an object under inspection based upon said transmission waveform;

a receiving element for receiving a reflection wave of said guided wave from an inspection region of said object under inspection;

analyzing means for outputting inspection information which is acquired based upon the reception waveform of said reflection wave received by said receiving element; and

display means for displaying thereon said inspection information.

2. A nondestructive inspection apparatus using a guided wave, as claimed in claim 1 wherein:

both said transmitting element and said receiving element correspond to the same element which is employed when said guided wave is generated and when said reflection wave is received.

3. A nondestructive inspection apparatus using a guided wave, as claimed in claim 1 wherein:

said reference waveform is made as a waveform which is wanted to be received by said receiving

element.

4. A nondestructive inspection apparatus using a guided wave, as claimed in claim 1 wherein:

said waveform forming means comprises: means for calculating reception waveforms of said reflection waves when said reflection waves are received by said receiving element; and means for forming the transmission waves in such a manner that said calculated reception waveforms are sequentially transmitted from such a reception waveform whose reception time is delayed.

5. A nondestructive inspection apparatus using a guided wave, as claimed in claim 1 wherein:

said display means comprises: means for displaying thereon a reference waveform.

6. A nondestructive inspection apparatus using a guided wave, as claimed in claim 1 wherein:

said display means comprises: means for displaying thereon said transmission waveform.

7. A nondestructive inspection apparatus using a guided wave, as claimed in claim 1 wherein:

said waveform forming means comprises: means for forming at least one of said transmission waveforms with respect to each of inspection segments, while the inspection region of said object under inspection is subdivided into a plurality of said inspection segments along a propagation direction of said guided wave.

8. A nondestructive inspection apparatus using a

guided wave, as claimed in claim 7 wherein:

said analyzing means comprises: means for extracting a reception wave portion of a time region corresponding to a certain distance of said inspection segment from said reception waveform, and for coupling said extracted reception wave portions to each other so as to form a reception waveform of an entire region of said inspection regions.

9. A nondestructive inspection apparatus using a guided wave, as claimed in claim 1 wherein:

said object under inspection corresponds to a pipe arrangement; a plurality of both said transmitting element and said receiving element and said receiving element are arranged around said pipe arrangement in a ring shape; and said nondestructive inspection apparatus further comprises: element switching means for switching connections made between said transmitting elements and said receiving elements with respect to both said guided wave transmitting means and said guided wave receiving means.

10. A nondestructive inspection apparatus using a guided wave, as claimed in claim 1 wherein:

said object under inspection corresponds to a pipe arrangement; and said nondestructive inspection apparatus further comprises: a scanner for mechanically scanning both said transmitting element and said receiving element along a circumferential direction of said pipe arrangement.

11. A nondestructive inspection apparatus using a guided wave, as claimed in claim 1 wherein:

said object under inspection corresponds to a pipe arrangement; said analyzing means comprises: an arrangement in which information of an inspection image is formed which is displayed on a plane where said inspection result is expanded along the circumferential direction of said pipe arrangement, and a picture signal of said information is outputted; and said display means comprises: an arrangement for receiving said information so as to display said inspection image.

12. A nondestructive inspection method comprising:

a step means for forming a transmission waveform by employing a reference waveform;

a step for generating a guided wave within an object under inspection based upon said transmission waveform;

a step for receiving a reflection wave of said guided wave from an inspection region of said object under inspection by a receiving element;

a step for acquiring inspection information which is acquired based upon the reception waveform of said reflection wave received by said receiving element; and

a step for displaying thereon said inspection information.

13. A nondestructive inspection method as claimed

in claim 12 wherein:

a relationship between a frequency of said transmission waveform and a thickness of said object under inspection is capable of satisfying such a condition that:

frequency (MHz) × thickness (mm) ≥ 0.5, and also, frequency (MHz) × thickness (mm) ≤ 4.0.

14. A nondestructive inspection method as claimed in claim 12 wherein:

a step for subdividing the inspection region of said object under inspection into a plurality of inspection segments along a propagation direction of said guided wave;

a step for forming said transmission waveforms every said inspection segment by setting said inspection segments as the inspection region, and for allocating one of said transmission waveforms to at least one of said inspection segments;

a step for receiving a reflection waveform every said inspection segment by employing said allocated transmission wave; and

a step for extracting a reception waveform portion reflected from the position corresponding to said inspection segment from said received reflection wave.

15. A nondestructive inspection method as claimed in claim 14 wherein:

a relationship between a frequency of said

transmission waveform and a thickness of said object under inspection is capable of satisfying such a condition that:

frequency (MHz) × thickness (mm) ≥ 0.5, and also, frequency (MHz) × thickness (mm) ≤ 4.0.

16. A nondestructive inspection method as claimed in claim 14, further comprising:

a step for coupling said extracted reception waveform portions to each other so as to acquire a coupled reception waveform.

17. A nondestructive inspection method as claimed in claim 16 wherein:

a relationship between a frequency of said transmission waveform and a thickness of said object under inspection is capable of satisfying such a condition that:

frequency (MHz) × thickness (mm) ≥ 0.5, and also, frequency (MHz) × thickness (mm) ≤ 4.0.

18. A nondestructive inspection method as claimed in claim 16 wherein:

said object under inspection corresponds to a pipe arrangement; and said nondestructive inspection method further comprises:

a step for subdividing the inspection region of said pipe arrangement into a plurality of circumferential segments along a circumferential direction;

a step for acquiring said reception wave

every said circumferential segment; and

a step for acquiring said coupled reception waveform every said circumferential segment

19. A nondestructive inspection method as claimed in claim 18 wherein:

a relationship between a frequency of said transmission waveform and a thickness of said object under inspection is capable of satisfying such a condition that:

frequency (MHz) × thickness (mm) ≥ 0.5, and also, frequency (MHz) × thickness (mm) ≤ 4.0.

20. A nondestructive inspection method as claimed in claim 18, further comprising:

a step for displaying the inspection result with employment of said coupled reception waveform acquired every said circumferential segment on a plane expanded view of said pipe arrangement.

21. A nondestructive inspection method as claimed in claim 20 wherein:

a relationship between a frequency of said transmission waveform and a thickness of said object under inspection is capable of satisfying such a condition that:

frequency (MHz) × thickness (mm) ≥ 0.5, and also, frequency (MHz) × thickness (mm) ≤ 4.0.